



unidentified moving object

technical

The Destination

Where This Challenge Will Take You!

A dam breaks, a bridge collapses, the electricity goes out—and the hustle and bustle of city life comes to a screeching halt. Few notice our nation's Infrastructure... until something goes wrong! It will take all your creative powers and construction talents to reach new heights and move Materials where they're needed most!

Points of Interest!

Your Team Will:

- Design and build Equipment to move various Materials to and from towering heights
- Start and end the Presentation with the Equipment contained in a Storage Box
- Create and present a Sales Promotion highlighting the features of the Equipment
- Complete all of the above with no AC electrical power

Sponsored by



CONSTRUCTION
CHALLENGE

PRESENTED BY:
VOLVO
Construction Equipment

In order to successfully solve this Challenge, teams must read and follow:

Team Challenge

- A. The *Central Challenge* (240 points)
- B. *Side Trips* (60 points)
- C. Presentation Site
- D. Reward Points

Rules of the Road

Published Clarifications

(online at www.IDODI.org)

The information in these materials is binding for all teams.

Team Managers are strongly encouraged to read and use:

- ☐ *Team Manager Guide*
- ☐ *Instant Challenge Practice Set*
- ☐ *TravelGuide for Teams* (available online after Jan 1, 2011)

Focus:

Design and Construction, Innovation and Design Process, Mathematics, Modularization, Optimized Design, Experimentation, Theater Arts, Teamwork

Time Limit:

The team must complete the Presentation (including setup) in eight minutes or less.

Team Budget:

The total value of the materials used in the team's Presentation may not exceed \$175US.

Roadmap for Success

This Challenge can be solved on many levels, ranging from the simple to the complex.

We recognize that there are different ways to be creative. This Challenge is designed to engage all types of creativity—including off-the-wall, outlandish thinking, analytical thinking, and everything in between. Please approach this Challenge in the true spirit of Destination ImagiNation: try foremost to solve the Challenge. If you find the intent or any of the details of the Challenge unclear, we encourage you to ask for a Clarification. (See the *Rules of the Road*.) Remember—if it doesn't say you can't, then you can. However, if it says you "must" perform specific requirements, then those requirements have to be met.

Team Number

Teams and individuals using these Program Materials must hold 2010-11 Team Numbers. The Destination ImagiNation Team Number is a license to compete in sanctioned Tournaments and/or to use the Program Materials for educational purposes within your team, school, group or organization. Online access to Program Materials for teams who have purchased Team Numbers is available at www.IDODI.org.

- ☐ My 2010-11 Team Number is: ____ - ____
- ☐ My team is planning to compete in a sanctioned Tournament.
- ☐ I have registered for that Tournament with the:
 - ☐ Regional or
 - ☐ Affiliate Director

A. THE CENTRAL CHALLENGE (240 POINTS)

1. **The Intent of the Challenge:** To solve this Challenge, the team must design, build, and operate Equipment that will fit completely into a team-provided Storage Box. Equipment will be inside the closed Storage Box at the start and end of the Presentation Time. When time begins, the Equipment may be removed from the Storage Box, assembled (if necessary), and used to move a variety of Materials. The team will also present a Sales Promotion for its Equipment that describes how it solves an Infrastructure problem. The team will earn points for:
 - a. Technical Design and Innovation of the Equipment.
 - b. The number of Materials correctly moved to scoring zones.
 - c. Having the Equipment completely in the closed Storage Box when time begins and ends.
 - d. Presentation of the Sales Promotion for the Equipment.

Note: The use of AC electrical power is not allowed in any portion of this Challenge.

2. **The Equipment:** The team will design and construct **Equipment** that can move Materials from the Tower to the Pool and from the Pool to the Tower. See Special Definition of Equipment at right.
 - a. The team will power Equipment by a **Technical Energy Source** or by **Team Generated Power**. See Special Definitions at right. If a Technical Energy Source is used, it is considered to be part of the Equipment.
 - b. A team member may not be the Equipment. Team members who operate or touch the Equipment are not considered to be part of the Equipment.
 - c. The Equipment must fit completely inside a team-provided Storage Box with rigid, flat sides, bottom and lid, and with maximum **outside** dimensions of 20in x 20in x 20in (0.51m x 0.51m x 0.51m), when all Equipment is stored inside. These dimensions include everything attached to the Storage Box. At the start of the team's Presentation time, all Equipment must be **fully enclosed** within the Storage Box, and the lid of the Storage Box must be closed. Materials moved by anything other than Equipment that is completely inside the Storage Box at the start of the Presentation time will receive zero points. After time begins, the team may remove Equipment and assemble it, if necessary. Storage Boxes that are larger than the maximum outside dimensions will result in zero points for Scoring Elements D.1.a and D.1.c.
 - d. All Equipment must be put back into the Storage Box, and the lid must be closed, before the completion of the 8-minute Presentation time or the team will receive zero points for Scoring Element D.1.c.
 - e. The Equipment must not modify the Tower or the Pool, and it must not touch the sides of the Tower or the Pool. Any Materials being moved when either of these events occur will receive zero points.
 - f. The Equipment must not be supported by the Tower or Pool. All weight-bearing floor contact points of the Equipment must remain outside the Pool. Any Materials being moved when the Equipment is supported by the Tower or Pool or if all weight-bearing floor contact points of the Equipment are not outside the Pool will receive zero points.



Special Definitions

Equipment: Any tools or machines that perform the transporting (lifting and moving) of Materials during the Presentation time.

Technical Energy Source: Any source of energy other than Team Generated Power or AC electrical power.

Team Generated Power: Team member(s) directly supplying power to one or more simple machines (e.g., lever, wheel & axle, pulley, screw, wedge, inclined plane) that is part of the Equipment.

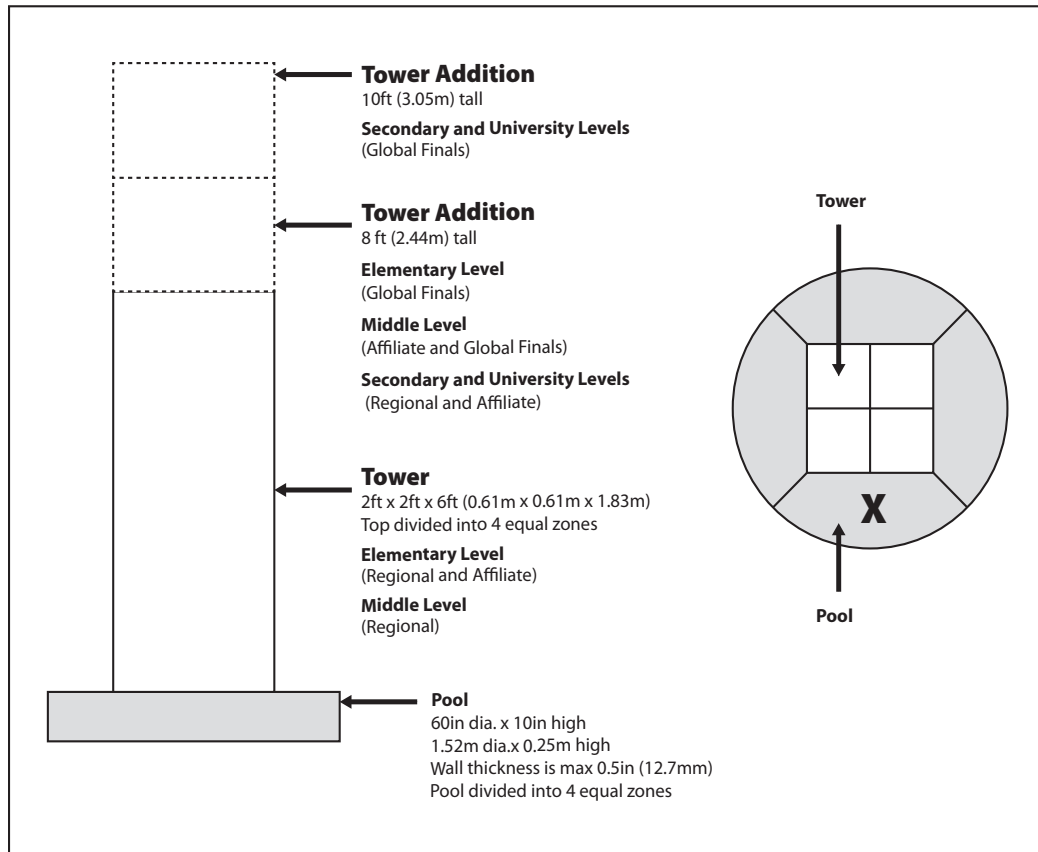


Note: Purchased cardboard boxes are often specified by their inside dimensions.

- g. Teams will earn points for:
- All Equipment stored completely inside the Storage Box, with the lid closed, when the team's Presentation time begins and ends.
 - The Technical Design and Innovation of the Equipment and power source.
3. **Tower and Pool:** At the Tournament, there will be a Tower located in the center of a Pool that will be placed near the center of the Presentation Site. (See Figure 1.)
- The Tower will be made from stacked 2ft x 2ft x 2ft (0.61m x 0.61m x 0.61m) corrugated boxes. Box dimensions are inside dimensions, so the outside dimensions will be slightly larger and may have slight variations. Tournament Officials will tape the boxes together and place weights inside the bottom box to provide additional stability.
 - At different levels of Tournaments, the height of the Tower will change as follows:

Team Level	Regional Tower	Affiliate Tower	Global Finals Tower
Elementary	6ft (1.83m)	6ft (1.83m)	8ft (2.44m)
Middle	6ft (1.83m)	8ft (2.44m)	8ft (2.44m)
Secondary	8ft (1.83m)	8ft (2.44m)	10ft (3.05m)
University	8ft (1.83m)	8ft (2.44m)	10ft (3.05m)

- The Pool will have dimensions of 60in (1.52m) diameter and 10in (0.25m) deep, with a maximum wall thickness of 0.5in (12.7mm). Regional and Affiliate Tournaments may construct the Pool using suitable materials, such as strips of cardboard or plastic.
- The Pool will be dry at Regional and Affiliate Tournaments. At Global Finals, the Pool will contain approximately 6in (15.24cm) of water. (Note that Tournament Officials will waterproof materials for the Tower.) Teams may not drain water from the Pool or add anything to the water.
- The Pool area and the top of the Tower will each be divided into four equal zones with taped lines. (See Figure 2.)

FIGURE 1

4. **Moving Materials:** The Tournament will provide eight Materials. The Materials must not be modified in any way and must be left in their original condition. Four Materials will start at the top of the Tower and four Materials will start in the Pool area. The Materials and their starting locations are as follows:

Materials Starting at the Top of the Tower

- 1/4in (M6 or M8) carriage bolt, between 2in (50mm) and 2.5in (63mm) long
- Empty plastic cup, approximately 4oz (0.12 liter)
- CD/DVD disc, approximately 4.5in (12cm) in diameter
- Uncapped empty plastic soda bottle, approximately 4in x 12in (10.2cm X 30.5cm)

Materials Starting in the Pool

- Unopened can of food, between 3in (7.6cm) and 3.5in (8.9cm) in diameter and between 1.5in (3.8cm) and 2in (5.1cm) in height, and weighing between 6oz (170g) and 9oz (255g)
- Golf ball, regulation size: approximately 1.7in (4.3cm) in diameter, weighing approximately 1.6oz (45g)
- Flat steel washer, between .75in (1.9cm) and 1.25in (3.2cm) in outside diameter, with a center hole with a minimum diameter of 1/8in (3.2mm)
- Sponge, approximately 3in x 5in x 0.75in (7.6cm x 12.7cm x 1.9cm)

- a. Prior to the Presentation time, the Appraisers will place four of the Materials near the center of the top of the Tower and four of the Materials in the Pool over the X. (See Figure 1.) Materials will be located randomly in those locations, but will not be placed on top of each other. The cup, bottle and can will be placed in their normal upright positions.



Special Definition

Infrastructure: The technical structures that support a society, such as roads, water supply, sewers, power grids, telecommunications, and so forth.

- b. The Equipment must move the four Materials from the Pool to any of the four zones on top of the Tower, and must move the four Materials from the top of the Tower to any of the four zones in the Pool.
 - i. The team will earn 10 points for each Material successfully moved from the Pool to the zones on the top of the Tower, and successfully moved from the top of the Tower to the zones in the Pool. **Only one Material will receive score in each zone.**
 - ii. The location of the Materials at the end of the team's Presentation time determines the score for Scoring Elements D.2.a and D.2.b.
 - iii. The Materials must be either touching the zone area or positioned directly above the zone area to score for a successful move.
 - iv. Any Materials that are touching the Equipment at the end of the team's Presentation time will receive zero points.
 - c. Materials moved by anything other than the Equipment or other Materials will receive zero points.
 - d. Team members may not touch, support, modify or attach things to the Tower or to the Pool. Any Materials being moved when any of these events occur will receive zero points.
 - e. If the team knocks over or moves the Tower or the Pool, the team must stop moving Materials and must return the Tower or the Pool to its original location before it may continue to move Materials, or those Materials will receive zero points. The Equipment, not team members, can be used to replace any already-moved Materials knocked out of their zones by this mishap. The 8-minute Presentation time will not be stopped.
 - f. Materials that roll or bounce away from the Tower or Pool may be retrieved by the Equipment unless they enter an area designated unsafe by Tournament Officials. These areas will be described to the team in the Prep Area.
 - g. Team members must remain on the ground at all times. Teams members may not climb up ladders or other elevating devices.
 5. **Sales Promotion:** The team will identify an **Infrastructure** problem that requires a quick response, and identify ways that its Equipment will help resolve the problem. See Special Definition of Infrastructure at left. The team must create and present a Sales Promotion highlighting the features of its Equipment, and describing how the Equipment and its features will help solve the problem.
 - a. The team must perform the Sales Promotion during the 8-minute Presentation time.
 - b. Teams will earn points for:
 - i. The creativity and effectiveness of the Sales Promotion as presented in the Presentation. To be effective, the Sales Promotion must clearly highlight the features of the Equipment, explaining how the features will help solve the Infrastructure problem.
 - ii. The integration of the movement of Materials into the Sales Presentation.
 6. **Team Identification Sign:** The team should provide a free-standing Identification Sign (ID Sign) of approximately 2ft x 3ft (0.6m x 0.9m) displaying your team's Team Name, Team Number, School/Organization (if different from Team Name), and Level. It cannot be used as a scoring element. See "Team Identification Sign" section in the *Rules of the Road* for further information.

B. SIDE TRIPS (60 POINTS)

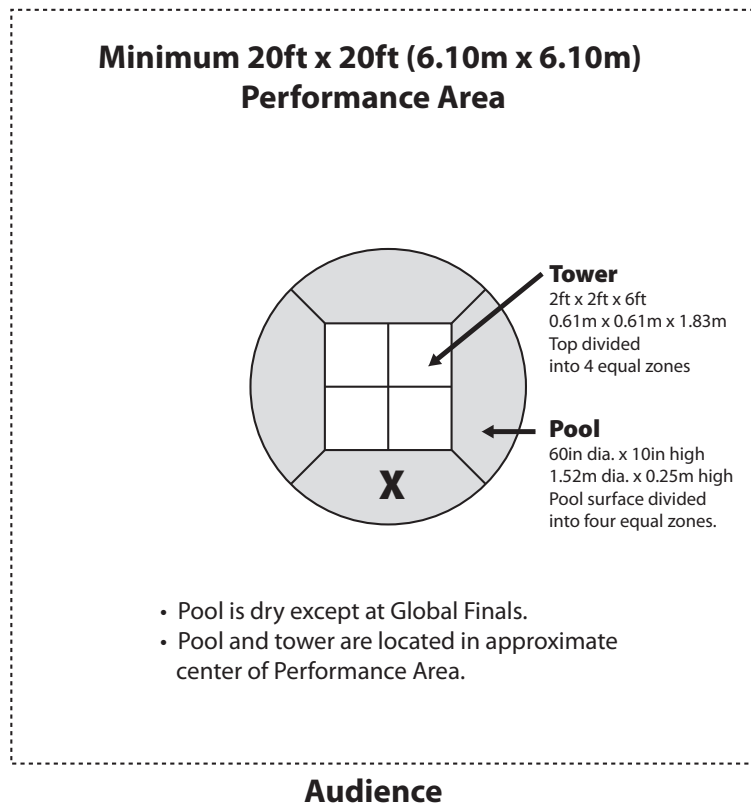
In addition to the above requirements, the team must present TWO creations, called *Side Trips*, that show off the team members' interests, skills, areas of strength and talents. Team members may create anything they wish for *Side Trips* including props, music, technical gadgets, costumes, physical actions, etc.

1. The team must present both *Side Trips* as part of the eight-minute Presentation, and each *Side Trip* should have a meaningful connection to the team's *Central Challenge* solution. Each *Side Trip* must be described briefly on the *Tournament Data Form* found at the end of this Challenge.
2. A *Side Trip* may not be a specific item that is required in the *Central Challenge* that is already being evaluated. A *Side Trip* MAY be a single unique PART of a required item, as long as it can be evaluated as a standalone item. Both *Side Trips* may be presented at the same time ONLY IF both can be easily identified and scored separately. Examples of these can be found in the *Rules of the Road*.
3. Each *Side Trip* will be evaluated in three ways: for the Creativity and Originality of the *Side Trip*; for the Quality, Workmanship, and/or Effort that is evident; and for the Integration of the *Side Trip* into the Presentation. Evaluation of *Side Trips* is subjective.

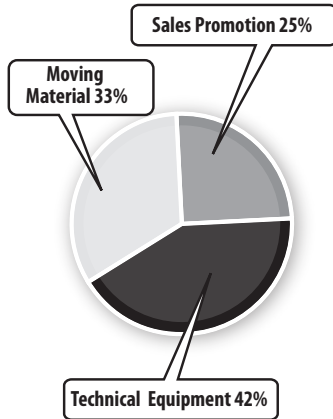
C. PRESENTATION SITE

1. **Floor Surface:** Destination ImagiNation strongly suggests that the Presentation Site be a large space with a hard floor such as wood, linoleum, concrete or very short-napped carpet. Teams should be prepared to deal with a variety of floor surfaces.
2. **Site Size:** The minimum required overall size of the Presentation Site is 20ft x 20ft (6.1m x 6.1m), but teams may use any additional space that Tournament officials designate as available. The 20ft x 20ft site will not be taped. A minimum ceiling height of 10ft (3.05m) is recommended for this Challenge at Regional and Affiliate Tournaments. At Global Finals, a minimum 20ft (6.1m) ceiling height will be provided.
3. **Electrical Power:** No AC power will be provided.

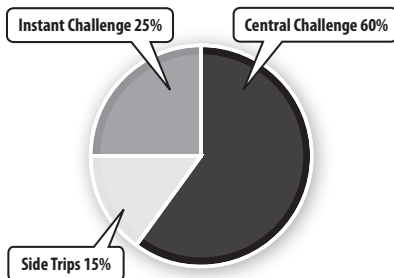
FIGURE 2



Team Challenge Scoring at a Glance



Putting It All Together



D. REWARD POINTS

ELEMENT	POINTS	DETAIL
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CENTRAL CHALLENGE

UP TO 240

1.	TECHNICAL EQUIPMENT	UP TO 100 POINTS	
	a. All Equipment completely inside the Storage Box, with the lid closed, when the team's Presentation time begins.	0 or 20 points	A.2.g.i
	b. The Technical Design and Innovation of the Equipment and power source.	Up to 60 points	A.2.g.ii
	c. All Equipment completely inside the Storage Box, with the lid closed, at the end of the team's Presentation time.	0 or 20 points	A.2.g.i
2.	MOVING MATERIALS	UP TO 80 POINTS	
	a. Materials moved to four Tower zones	0, 10, 20, 30 or 40 pts	A.4.b.i
	b. Materials moved to four Pool zones	0, 10, 20, 30 or 40 pts	A.4.b.i
3.	SALES PROMOTION	UP TO 60 POINTS	
	a. Creativity of the Sales Promotion	Up to 25 points	A.5.b.i
	b. Effectiveness of the Sales Promotion	Up to 25 points	A.5.b.i
	c. Integration of the movement of Materials into the Sales Presentation	Up to 10 points	A.5.b.ii

SIDE TRIPS

UP TO 60

4.	SIDE TRIP	UP TO 30	
	a. Creativity and Originality	Up to 10	B.3
	b. Quality, Workmanship, or Effort that is evident	Up to 10	B.3
	c. Integration into the Presentation	Up to 10	B.3
5.	SIDE TRIP	UP TO 30	
	a. Creativity and Originality	Up to 10	B.3
	b. Quality, Workmanship, or Effort that is evident	Up to 10	B.3
	c. Integration into the Presentation	Up to 10	B.3

Tournament Data Form

Challenge A: Unidentified Moving Object

Page 1 of 2

Team Name: _____ Team Number: _____ - _____

School/Organization: _____ Level: EL ML SL UL

To the team and Team Manager(s): Help your Appraisers identify the required elements of your Challenge solution so they can award you all of the points you have earned. Please fill this form out completely and neatly. For Elementary Level teams only: Team Managers MAY fill out the form, writing out the words dictated by the team.

A: Paperwork

Required Paperwork: At the Tournament Presentation Site, the Prep Area Appraiser will ask for your team's forms. A complete checklist of the required forms is below. None of the forms listed below can be used as a scoring item.

Your team needs:

- ☐ Five copies of this completed two-page *Tournament Data Form*. Be sure to copy both pages of this form. This is PAGE ONE of the form. Page Two may be copied onto the back of this sheet.
- ☐ Two copies of the completed *Declaration of Independence*. Blank copies of this form can be found in the *Rules of the Road*. One copy of this form is for *Team Challenge*, the other copy of is for you to take to *Instant Challenge*.
- ☐ One copy of the completed *Expense Report*. This form can be found in the *Rules of the Road*. Be sure to bring copies of your receipts in case you are asked for them, but it is not necessary to attach them to the form.
- ☐ Team Identification Sign: This will tell the Appraisers and the audience who you are. It must list your Team Name, Team Number, School/Organization (if different from Team Name), and Level. It cannot be scored. See the *Rules of the Road* for more information.
- ☐ Published Clarifications: We have read and are aware of the Published Clarifications on www.IDODI.org.

B: Side Trips

Side Trip 1: What is your Side Trip? _____

Please write a brief description of your *Side Trip*. Make sure that Appraisers know exactly what you want them to evaluate. What would you like them to know about the *Side Trip*?

Side Trip 2 : What is your Side Trip? _____

Please write a brief description of your *Side Trip*. Make sure that Appraisers know exactly what you want them to evaluate. What would you like them to know about the *Side Trip*?

Tournament Data Form

Challenge A: Unidentified Moving Object

Page 2 of 2

Team Name: _____ Team Number: ____ - ____

School/Organization: _____ Level: EL ML SL UL

C: Challenge Information

1. Describe your Equipment and its power source.
2. Describe how your Equipment will move the Materials.
3. Briefly describe the Infrastructure problem identified by the team.
4. Briefly outline the features of your Equipment and how they will help solve the team's Infrastructure problem.